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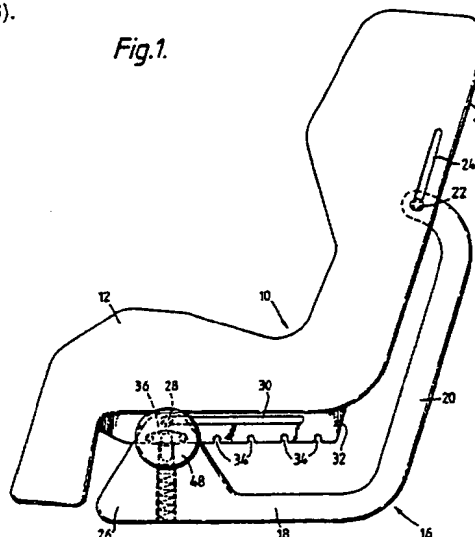
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(54) Child's safety seat.

(57) A child's safety seat has a support member (16) having a base portion (18) adapted to rest on a substantially horizontal surface and a back portion (20) extending upwardly from the base portion (18). A seat member (10) is pivotally mounted on the upper end of the back portion (20) of the support member (16) by a pivot pin (22) secured to the back portion (20) of the support member (16) and engaging in a elongate slot (24) in the seat member (10). The seat member (10) is coupled to the base portion (18) of the support member (16) by a guide follower (28, 66, 68) secured to the front end of the base portion (18) of the support member (16) which engages in a guide track (30, 62) extending along the bottom of the seat member (10). A series of detent formations (34) extends parallel to the direction of movement of the guide follower (28, 68) along the guide track (30, 62). A locking member (36) is mounted on the support member (16) for selective engagement with said detent formations (34) to secure

the seat so as to secure the seat member (10) in a selected orientation relative to the support member (16).

Fig.1.



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EP 0 325 352 A2

CHILD'S SAFETY SEAT

This invention relates to a child's safety seat of the type comprising a support member having a base portion adapted to rest on a substantially horizontal surface and a back portion extending upwardly from the base portion, a seat member pivotally mounted on the upper end of the back portion of the support member, and coupling means connecting the seat member to the base portion of the support member so as to secure the seat member in a selected orientation relative to the support member.

According to the invention, in a safety seat of this type, the pivotal mounting of the seat member on the upper end of the back portion of the support member comprises a pivot pin secured to the back portion of the support member and engaging in a elongate slot in the seat member, and the coupling means comprises a guide follower secured to the front end of the base portion of the support member and engaging in a guide track extending along the bottom of the seat member, a series of detent formations extending parallel to the direction of movement of the guide follower along the guide track and a locking member mounted on the support member for selective engagement with said detent formations to secure the seat member in said selected orientation.

An embodiment of the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a side view of a child's safety seat in accordance with the invention at one end of the range of adjustment of the orientation of the seat member relative to the support member;

Figure 2 is a side view of the seat shown in Figure 1 but at the opposite end of the range of adjustment;

Figure 3 is a fragmentary side view on an enlarged scale of the locking mechanism of the seat shown in Figure 1;

Figure 4 is a cross-sectional view taken on the line 4 - 4 in Figure 3;

Figure 5 is a fragmentary side view, similar to Figure 3, of a modified embodiment of the invention; and

Figure 6 is a cross-sectional view taken on the line 6 - 6 in Figure 5.

Referring to Figure 1, a child's safety seat consists of a seat body 10 having a seat portion 12 and a back rest portion 14. The seat body 10 is mounted on an L-shaped support member 16 having a base limb 18 and an upwardly extending back limb 20.

The upper end of the back limb 20 of the

support member 16 is bent forwardly and carries a transverse pin 22 which engages in a slot 24 in the back portion 14 of the seat body 10, the slot 24 extending substantially parallel to the back rest thereof. A generally triangular projection 26 is formed integrally with the front end of the base limb 18 and carries a transverse pin 28 which engages in a slot 30 formed in a flange 32 secured to the bottom surface of the seat portion 12.

It should be appreciated that a similar pin to the pin 22 projects from the opposite side of the back limb 20 into engagement with a similar slot to the slot 24 on the other side of the seat body 10, and that a similar pin to the pin 28 projects from another triangular projection on the other side of the base limb 18 into engagement with a slot similar to the slot 30 in another flange similar to the flange 32 on the other side of the bottom of the seat portion 12. The seat body 10 is thus supported on the support member 16 at four locations.

In Figure 1 the pin 28 is shown at the front end of the slot 30 and the pin 22 at the bottom end of the slot 24. The seat body 10 is in its most upright position. Referring to Figure 2, the seat body 10 can be moved relative to the support member 16 to bring the pins 22 and 28 to the opposite ends of their respective slots 24 and 30, putting the seat body 10 in its fully reclined position. The seat body 10 takes up a succession of intermediate positions as the pins 22 and 28 move along their respective slots 24 and 30.

In order to secure the seat body in a desired position, a row of six uniformly spaced open-ended detent slots 34 are formed in the bottom edge of the flange 32. As can best be seen in Figures 3 and 4, a pair of locking plates 36 and 38 are located on opposite sides of the flange 32 and interconnected by a pair of locking studs 40 and 42 which are spaced apart so as to simultaneously engage in adjacent detent slots 34. A stub axle 44 is secured fast with the locking plate 36 so as to project outwardly through a substantially vertical guide slot 46 in the triangular projection 26 and carries a control knob 48 on its outer end.

Co-axially with the stub axle 44, a control rod 50 extends from the other locking plate 38 under the seat body 10 to the other side of the support member 16, where it is secured to a similar locking mechanism (not shown) which engages with the above-mentioned flange corresponding to the flange 32. The common axis of the control rod 50 and the stub axle 44 is located half way between the two locking studs 40 and 42.

A vertically extending cylindrical housing 52, secured to the base limb 18 of the support mem-

ber 16, contains a plunger 54 which is upwardly biased by a compression spring 56 so as to engage with the control rod 50, thereby to urge the stub axle 44 to the top of the guide slot 46.

When the mechanism is in the position shown in Figures 1, 3 and 4, the engagement of the two locking studs 40 and 42 in the front two detent slots 34 in the flange 32 prevent movement of the seat body 10 relative to the support member 16. If the knob 48 is turned in the counter-clockwise direction, as viewed in Figures 1 and 3, the locking plates 36 and 38 pivot on the locking pin 42 nearer to the rear of the flange 32, so that the other locking pin 40 moves out of engagement with the front detent slot 34 and the stub axle 44 moves downwardly in the guide slot 46.

Continued rotation of the knob 48 brings the locking pin 40 into engagement with the third of the detent slots 34 from the front. The seat 10 is now secured in its next stable position, the compression spring 56 preventing the mechanism remaining in any position in which both locking pins 40 and 42 are in engagement with adjacent slots 34. Continued rotation of the knob 48 causes the seat body 10 to take up successive positions of increasing inclination until the stud 42 is received in the rear-most detent slot 34, as shown in Figure 2. Rotation of the knob 48 in the clockwise direction, as viewed in Figures 1, 2, and 3, moves the seat body 10 to a more upright position.

Figures 5 and 6 illustrate a modified embodiment of the invention in which parts identical with corresponding parts of the embodiments shown in Figures 3 and 4 are denoted by the same reference numerals and will not be described again in detail. The flange 32 is replaced by a much deeper flange 60 containing an elongate opening 62 near its bottom edge. The open-ended detent slots 38 are formed along the upper edge of the opening 62. The outer locking plate 36 of Figures 1 to 4 is replaced by an enlarged locking plate 64 having two cam lobes 66 and 68 extending in opposite directions perpendicular to the line joining the locking studs 40 and 42. The flange 60 has a step formation 70, 72, arranged to position the lower edge 74 of the opening 62 in alignment with the locking plate 64. The lower edge 74 of the opening 62 is in the shape of a complementary cam formation such as to remain in constant engagement with the periphery of the locking plate 64 formed by the cam lobes 66 and 68. The cam lobes 66 and 68 thus prevent downward movement of the stub axle 44 except in conjunction with rotational movement thereof, thereby ensuring that at least one of the locking studs 40 and 42 is in engagement with one of the detent slots 38 at all times. The pin 28 and slot 30 are not essential but their presence is preferable since they reduce friction by holding the

cam lobes 66 and 68 out of engagement with the lower edge 74 except when an attempt is made to move both locking studs 40 and 42 out of their respective detent slots 38 simultaneously.

The compression spring 56 of Figures 1 to 4 is replaced by a tension spring 76 which extends between the control rod 50 and a saddle formation 78 projecting upwardly from the base limb 18.

The compression spring 56 of Figures 1 to 4 may be used with the embodiment of Figures 5 and 6 and the tension spring 76 of Figures 5 and 6 may be used with the embodiment of Figures 1 to 4.

Claims

1. A child's safety seat comprising a support member (16) having a base portion (18) adapted to rest on a substantially horizontal surface and a back portion (20) extending upwardly from the base portion (18), a seat member (10) pivotally mounted on the upper end of the back portion (20) of the support member (16), and coupling means connecting the seat member (10) to the base portion (18) of the support member (16) so as to secure the seat member (10) in a selected orientation relative to the support member (16), characterised in that the pivotal mounting of the seat member (10) on the upper end of the back portion (20) of the support member (16) comprises a pivot pin (22) secured to the back portion (20) of the support member (16) and engaging in a elongate slot (24) in the seat member (10), and the coupling means comprises a guide follower (28, 66, 68) secured to the front end of the base portion (18) of the support member (16) and engaging in a guide track (30, 62) extending along the bottom of the seat member (10), a series of detent formations (34) extending parallel to the direction of movement of the guide follower (28, 68) along the guide track (30, 62) and a locking member (36) mounted on the support member (16) for selective engagement with said detent formations (34) to secure the seat member (10) in said selected orientation.

2. A child's safety seat according to claim 1, wherein each detent formation comprises an open-ended detent slot (34), and the locking member (36) has a pair of locking studs (40, 42) spaced apart so as to be engageable in adjacent detent slots (34), the locking member (36) being mounted on the support member (16) in guide means (46) permitting translational movement of the locking member (36) towards and away from the detent slots (34) and rotational movement about an axis (50) located between the locking studs (40, 42).

3. A child's safety seat according to claim 2, wherein the locking member (36) is resiliently biased towards the detent formations (34).

4. A child's safety seat according to claim 1, 2, or 3, wherein the guide follower comprises a second pin (28) secured to the front end of the base portion (18) of the support member (16) and the guide track comprises a second slot (30) formed in the base portion (18).

5. A child's safety seat according to claim 4, wherein the guide means (46) is arranged to permit translational movement of the locking member (36) through a distance equal to the distance of the axis of rotation (50) thereof from each locking stud (40, 42) so as to allow pivotal movement of the locking member (36) about one of the studs (40, 42) as such stud remains engaged in one of the detent slots (34) as the other of the studs (40, 42) moves between the adjacent detent slot (34) on one side of said one detent slot (34) to the adjacent detent slot (34) on the other side of said one detent slot (34).

6. A child's safety seat according to claim 5, wherein the guide follower comprises a cam (66, 68) secured to the locking member (64) and the guide track comprises an opening (62) formed in the base portion (18) with the detent formations (34) in its upper edge and a cam profile (74) on its lower edge shaped so that, at all times, at least one of the studs (40, 42) is engaged in a detent formation (34).

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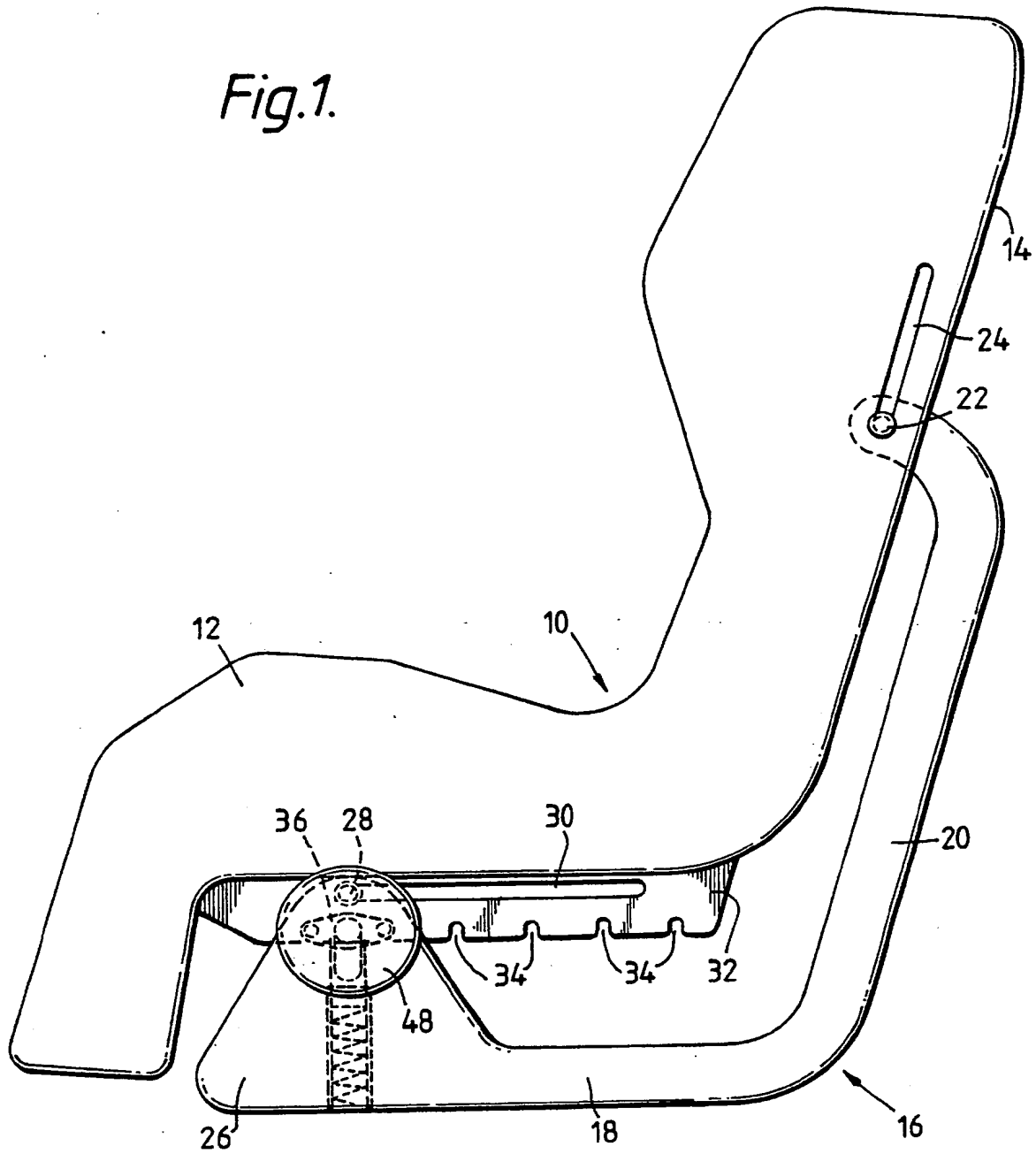
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Fig.1.



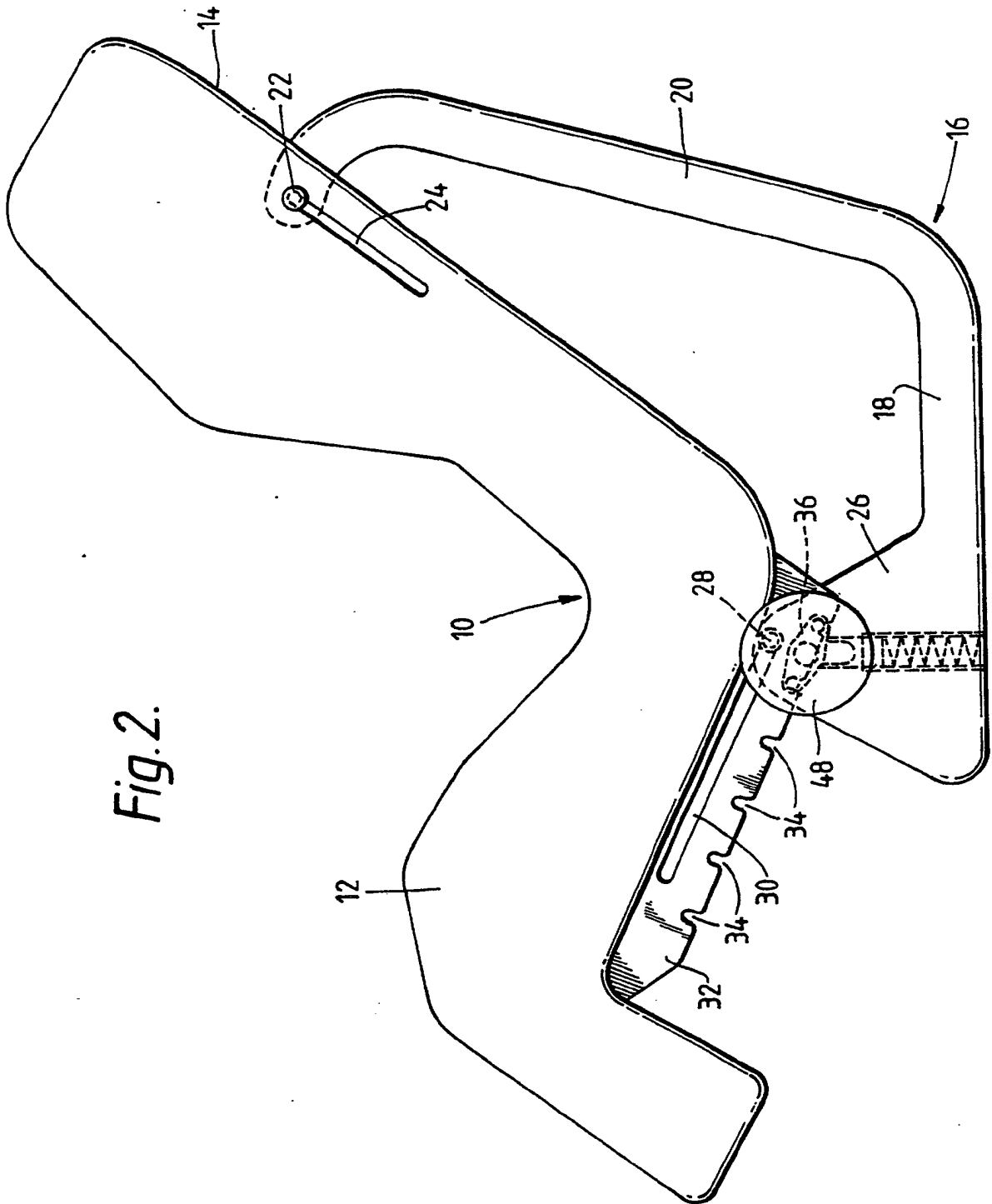


Fig. 2.

Fig.3.

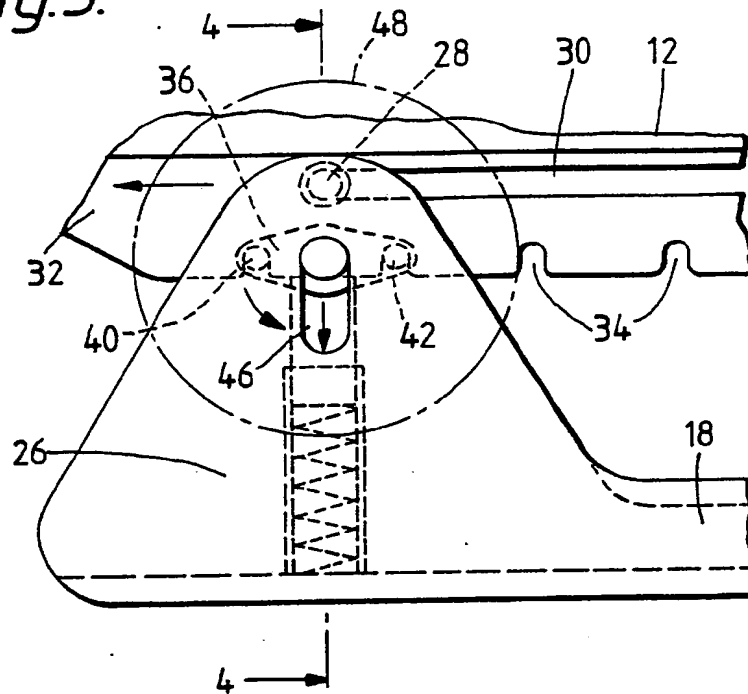
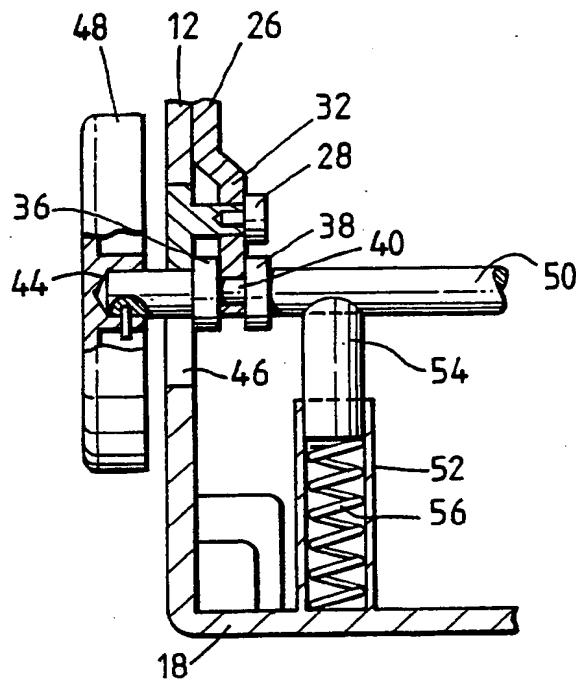
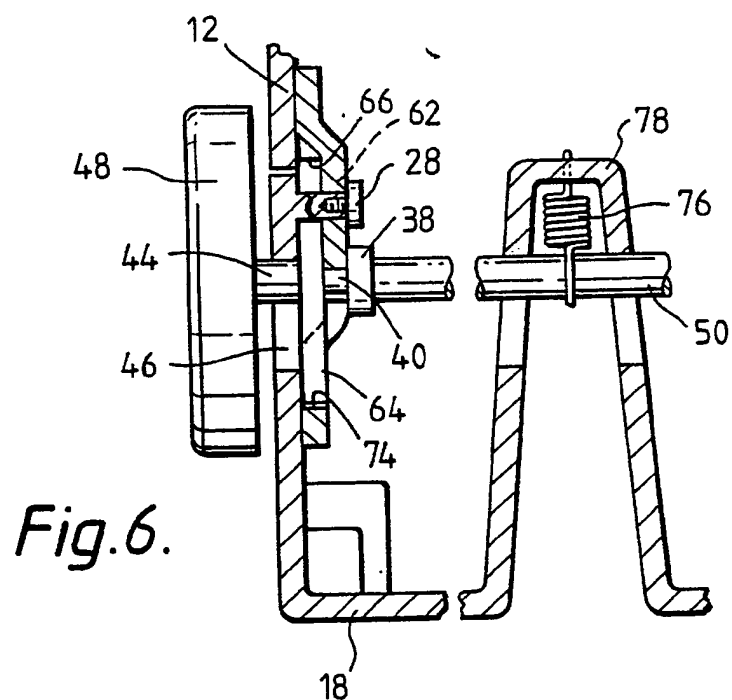
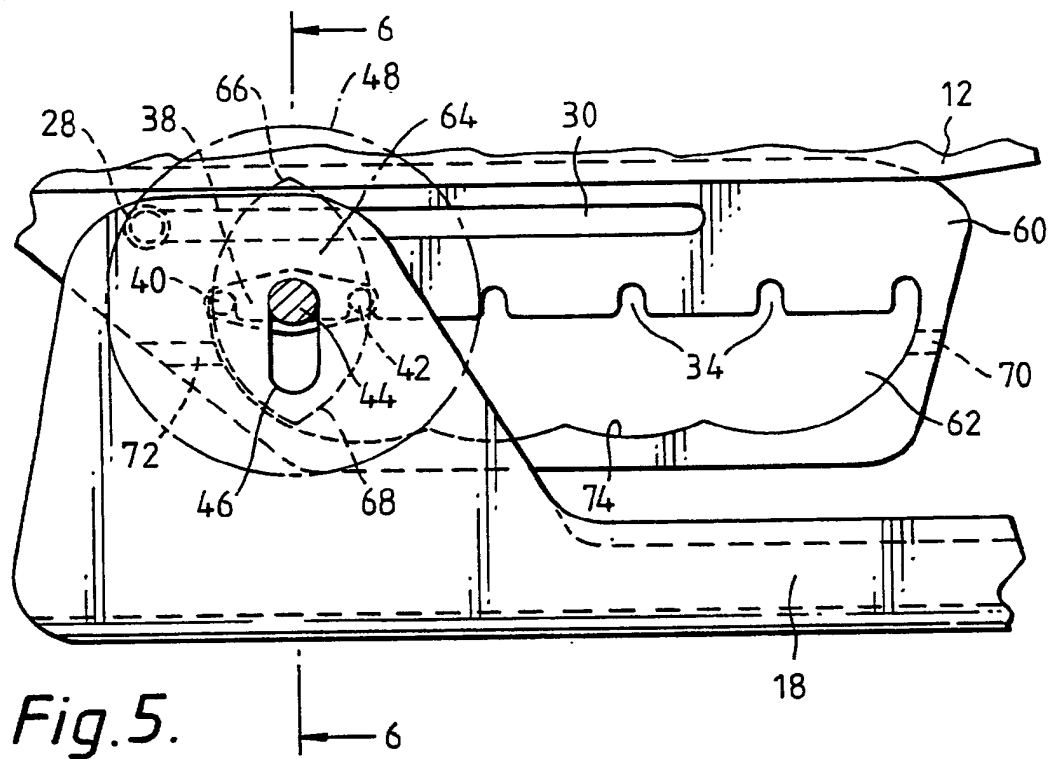


Fig.4.





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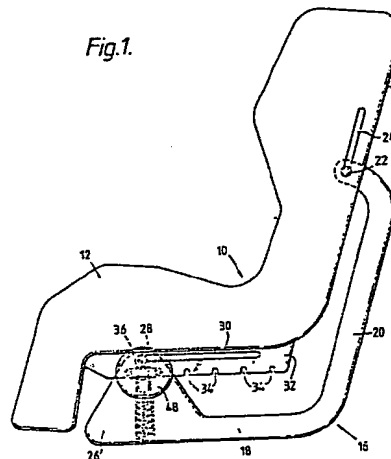
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07.02.90 Bulletin 90/06(71) Applicant: **ROMER-BRITAX AUTOGURTE GMBH**
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Chichester West Sussex PO19 2AQ (GB)(54) **Child's safety seat.**

(57) A child's safety seat has a support member (16) having a base portion (18) adapted to rest on a substantially horizontal surface and a back portion (20) extending upwardly from the base portion (18). A seat member (10) is pivotally mounted on the upper end of the back portion (20) of the support member (16) by a pivot pin (22) secured to the back portion (20) of the support member (16) and engaging in a elongate slot (24) in the seat member (10). The seat member (10) is coupled to the base portion (18) of the support member (16) by a guide follower (28, 66, 68) secured to the front end of the base portion (18) of the support member (16) which engages in a guide track (30, 62) extending along the bottom of the seat member (10). A series of detent formations (34) extends parallel to the direction of movement of the guide follower (28, 68) along the guide track (30, 62). A locking member (36) is mounted on the support member (16) for selective engagement with said detent formations (34) to secure the seat so as to secure the seat member (10) in a selected orientation relative to the support member (16).

Fig.1.



EP 0 325 352 A3



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EUROPEAN SEARCH REPORT

Application Number

EP 89 30 0170

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| A | EP-A-0 228 158 (ASE) * Column 18, line 31 - column 19, line 21; figures * | 1 | B 60 N 1/12 |
| A | DE-A-2 221 489 (ETABLISSEMENTS) * Page 4, line 1 - page 5, line 12; figures * | 1 | |
| A | US-A-3 645 548 (A.N. BRINER) * Column 1, line 64 - column 2, line 46; figures * | 1 | |
| A | EP-A-0 116 965 (HAMMERSTEIN) * Page 7, line 8 - page 8, line 28; figures * | 2,3,5,6 | |
| | | | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| | | | A 47 D B 60 N B 60 R |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 30-10-1989 | Examiner HORVATH R.C. |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

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